

Project Title: Gut hormone receptor studies

Project type: Laboratory: Immunohistochemistry of human tissue sections

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Project description

Analogues of gut hormones (e.g., GLP-1, PYY) are increasingly investigated to treat a variety of diseases and disorders (e.g., type 2 diabetes, obesity, irritable bowel syndrome, motility disorders). Mechanisms of action are complex and poorly understood. In fact, it is even debated as to whether some of them even meet criteria to be called hormones. Many of them have actions in the CNS that can signal through the vagal nerve to the GI tract. However, receptors for all of them can be found within the GI tract. We have published evidence demonstrating peripheral actions in excised tissues, such as GLP-1 inducing muscle relaxation in excised human gut, also showing presence of GLP-1 receptor (GLP-1R). We are also exploring mechanisms of actions for PYY and have demonstrated presence of PYY receptor (PYY-R) throughout the human GI tract. Current projects focus on identifying the exact cell subtypes within human GI tract that possess GLP-1R and PYY-R and putting this data into context of mechanisms for reported actions.

These projects entail a combination of analysis of completed immunohistochemistry slides and development of methods for multi-labelling. All students will learn basic IHC methodology. Students can then usually choose between focusing more on analytical problems or more on multi-labelling procedures. Among challenges faced by students in gastroenterology is the large number of different cell types. For this reason, gastroenterology projects typically involve learning about the complex anatomical organization of the human gut and functional relationships between many different cell types.

We work with human gut tissue, blood and urine. Real samples from real hospitals do not always come from healthy people. Please take into consideration your status with hepatitis B vaccination.